

A Pile of Retirements: The Next 10 Years for Western Coal Plants

AUGUST 19, 2019 BEN KUJALA

ENERGY &
TELECOMMUNICATIONS
INTERIM COMMITTEE 2019-2020

September 23, 2019

Exhibit 9

Coal has been used to generate electricity from the beginning of the electric grid. [Pearl Street Station](#), the first commercial central power plant, used coal. The technology for generating electricity was quickly sent West. The first commercial electric grid outside of New York was in the Northwest. Hydroelectric generation at [Willamette Falls](#) in Oregon City was used to light the streets of Portland. In the years between 1882 and 2019, the electric grid expanded from 14 miles to thousands of miles of wire. And as the wires snaked out through the West, coal and water were the primary fuels used to generate the electricity needed to support the grid.

But generating electricity from coal, at least in the West, may become a thing of the past. And utilities' plans indicate the decline of coal generation in the West will be rapid over the next decade.

Retirements have been expected

We've been talking about coal retirements as a means to reduce greenhouse gas emissions for a long time. In 2010, Portland General Electric [announced](#) the retirement of the Boardman coal plant by 2020. In 2011, Washington [passed legislation](#) retiring the Centralia coal plant by 2025. Utility decisions on retirements at [Colstrip](#) and [Valmy](#) plants followed later. And that's just in the Northwest. Other regions in the West have had similar conversations about their coal fleets.

However, the next decade is where we will see these plants quit producing electricity. And an increasing number of utilities are retiring coal [because of competition from natural gas, solar, and wind generation](#). These retirements for economic reasons come with far less notice and are on top of retirements based on regulation, legislation, and court settlements. See chart and underlying [Excel data](#).

Pressure on coal

Economic, regulatory, and environmental pressures have led to coal generation retirements. In aggregate, the Western coal fleet that can generate over 34,000 megawatts today is expected to be able to generate closer to 16,000 megawatts in 2030. Coal generation was around 17 percent of the dependable capacity Western utilities [reported](#) in 2016. In the future, it will be far less.

The pressure on coal can be seen not only in the plans for retiring coal plants, but also in the difficulties faced by the companies that mine coal. In 2006, TransAlta, the owner of the Centralia Coal Plant, [closed the associated mine that was the last one in Washington](#). In 2019, three large mining companies have been in bankruptcy. Westmoreland Coal Co., the owner of the Rosebud mine that supplies Colstrip, [emerged from bankruptcy in March](#). Cloud Peak, a company that mines coal in Montana and Wyoming [filed for bankruptcy on May 10th](#). Blackjewel, a coal mining company in Wyoming, [also declared bankruptcy](#). How long production will continue at the mines wrapped up in the Blackjewel bankruptcy is [an open question](#).

Yet coal generation has supplied the power and services needed to run the electric grid. Retiring coal is a decision made utility-by-utility and state-by-state. But these decisions, in aggregate, will change the market for electricity. It will also reduce greenhouse gas emissions related to generating electricity.

How should the Northwest respond?

In the next decade, coal plant retirements will change the Western electric grid. This will impact the price and availability of electricity for Northwest utilities in electricity markets. A change of this magnitude also raises concerns about having enough generators to

reliably operate the grid. How utilities decide to replace these resources will impact the cost and reliability of electricity, in the Northwest and more broadly in the West, for many years to come.

How should the Northwest respond to those changes? The 2021 Power Plan is an opportunity for the Council to study this question with help from our [advisory committees](#). Join us at the next [joint Generating Resource Advisory Committee and System Analysis Advisory Committee meeting](#). Or [follow us](#) on Twitter to get notifications of future advisory committee meetings.

Interactive map of Western coal production retirements

Circle sizes represent megawatts of operating capacity, hover for project details. Use the slider handles at right to see project retirements over the next 20 years. Click icon at top-right for full-screen.

Western coal project retirements

Show projects retiring between:
and

Or select projects by status



[Shrink legend for screen-capture](#)

Updated Aug 2019 by [Gillian Charles](#).

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Resource Adequacy Symposium is Coming This Fall

Registration is underway for the Resource Adequacy Symposium, hosted by the Northwest Power Pool in Portland, Oregon on October 2, 2019.

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Navigating a Complex Path to a

Montana Renewable Development Action Plan Recommendations & Action Items September 2019 Update

	Recommendations & Action Items	Parties	Status	Contact
1	<p>BPA and the Colstrip Transmission System (CTS) owners should review the Montana Intertie Agreement (MIA) and the CTS Agreement and make modifications, as necessary, to facilitate future utilization of the Montana Intertie and CTS based on non-discriminatory, open access principles, and with the timing of production tax credits in mind. Possible modifications include:</p> <p>a) Addressing third-party and non-Colstrip use.</p> <p>b) Reviewing the appropriateness of the CTS and MIA five percent loss rate for third-party use.</p>	<ul style="list-style-type: none"> • Avista • BPA • NorthWestern • PacifiCorp • Portland General • Puget Sound Energy 	<p>Parties may memorialize/document their understanding that there can be third party use of the MI (transfer of a CTS party's surplus rights to BPA for sale under BPA's OATT) and how it can happen. Parties have not yet reached agreement on whether to and how to proceed.</p> <p>Under one option, third party usage may be enabled without a contract amendment under which a third party can submit a single TSR to BPA.</p> <p>There is a single 5% flat loss rate for all non-CTS parties, no pancaked losses. Parties to relook at the 5% losses on the MI and CTS to determine the "appropriateness" of the flat 5% contractual figure and update the agreements, if necessary. Parties have not yet reached agreement on whether to or how to proceed.</p> <p>There have been no further meetings or discussions between the CTS parties and BPA on these issues.</p>	Brian Altman, BPA

MRDAP Recommendations & Action Items – September 2019 Update

	Recommendations & Action Items	Parties	Status	Contact
2	Montana renewables project developers should present credible and executable transmission plans to potential purchasers. Purchasers considering Montana renewables should allow a reasonable period after a resource is identified for acquisition to work with the developer to execute the transmission plan.	<u>Developers:</u> <ul style="list-style-type: none"> Absaroka Haymaker Wind NaturEner Orion Pattern <u>Potential purchasers:</u> <ul style="list-style-type: none"> Avista PacifiCorp Portland General Puget Sound Energy 	The PGE RFP final short list included a Montana renewable resource that was not chosen for commercial reasons unrelated to access to transmission.	Shaun Foster, PGE / Brian Altman
3	As opportunities arise to meet flexible capacity needs for Montana renewables, BPA should consider requests for providing products and services for integrating resources located outside the BPA balancing authority.	BPA	On-going: BPA to be responsive as necessary.	
4	Pacific Northwest utilities that may have an interest in acquiring Montana renewables should include scenarios with Montana renewables when studying their flexible capacity needs.	<ul style="list-style-type: none"> Avista PacifiCorp Portland General Puget Sound Energy 	On-going: OPUC order 17-386 directed PGE to explore issues of transmission for and access to Montana and Wyoming high capacity wind resources in its 2019 IRP. Interested parties can find slides from PGE workshops on 11/28 and 12/19/18 at PGE's IRP Public Meetings page.	Shaun Foster
5	BPA and NorthWestern Energy should seek a negotiated solution to the 184MW transmission capacity dispute as soon as possible.	<ul style="list-style-type: none"> BPA NorthWestern 	Completed June 2018: Approved by FERC Sept 2018.	

MRDAP Recommendations & Action Items – September 2019 Update

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6	BPA should hold a pre-rate case workshop discussion on alternatives for the Montana Intertie rate.	BPA and stakeholders	Completed September 2018: In FY19 the SCD charge on the MT Intertie is zero and the settled rates in BP-20 also do not charge SCD. BPA will propose the same treatment in BP-22.	
7	Avista, BPA, NorthWestern Energy, and transmission customers should work together to evaluate possible comparable changes to transmission tariffs and business practices that may be impediments to exporting Montana renewables.	<ul style="list-style-type: none"> Absaroka Avista BPA Haymaker Wind NorthWestern (Lead) Orion Renewable NW Other interested parties 	Completed January 2019: Parties memorialized the discussion/conclusions with a written document related to redirects, partial service and Service Across Multiple Transmission Systems (SAMTS).	
8	For service on the existing BPA network, BPA should evaluate the feasibility and business case for offering conditional firm service for Montana exports, especially as a bridge product to long-term firm on its external interconnections.	BPA	Completed January 2019: BPA notified parties in late 2018 that limited conditional firm offers on West of Garrison will now be available and a follow-up customer meeting addressing this is scheduled for January 31, 2019.	
9	BPA should consider modifying its tariff terms and conditions to allow for developer-funded National Environmental Policy Act (NEPA) costs to be refunded if long-term firm service is ultimately purchased at rolled-in embedded cost rates. This would be consistent with how environmental and permitting costs are treated by other transmission providers under the Federal Energy Regulatory Commission's "greater of" pricing policy.	BPA	Completed January 2019: After Internal BPA discussion, there will be no change to BPA's OATT. NEPA costs will not be refunded.	

MRDAP Recommendations & Action Items – September 2019 Update

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10	BPA should complete its determination that resource movement in only one direction within an operating hour does not consume DTC.	BPA	Completed March 2018	
11	BPA should implement a new business practice and required systems to operationalize its DTC decision.	BPA	To be completed by June 1, 2021	Bart McManus/ Libby Kirby
12	BPA should modify its existing business practice to specify the current Garrison interchange DTC limit as is currently done for the southern and northern interties.	BPA	This is moving forward. It is expected to be completed by June 2020.	Bart McManus/ Libby Kirby
13	<p>BPA should undertake actions to increase available transfer capacity on the BPA network in order to allow imports from Montana to reach I-5 load centers.</p> <p>a) Consider administrative changes resulting in additional ATC availability</p> <p>b) Consider flexible, scalable options to meet service requests across network flowgates:</p> <ul style="list-style-type: none"> i. Non-wires ii. Planning re-dispatch iii. Battery storage iv. Demand-side management 	BPA	In response to TSEP and Cluster Studies, BPA has executed new Long-Term Conditional Firm offers totaling 150 MW. In addition, BPA has extended offers and will be making additional offers for Preliminary Engineering Agreements to lower queued parties for plans of service involving RAS and M2W.	Brian Altman
14	<p>Studies must be done in a formal interconnection process when specific generators are identified to include:</p> <p>a) Local voltage control</p> <p>b) Sub-synchronous resonance</p> <p>c) RAS design</p>	NorthWestern	On-going: Will be addressed as needed upon generation interconnection requests.	

MRDAP Recommendations & Action Items – September 2019 Update

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15	A scope of work should be developed to guide the studies needed should a future retirement or an unexpected, sustained outage of Colstrip units 3 and 4 occur.		Completed April 2018	
16	NorthWestern, with support from the other Colstrip Owners and BPA, should undertake timely blackstart, sub-synchronous resonance mitigation, RAS, and WECC Path Rating requirements when specific replacement generation for Colstrip unit retirement is identified and the technical attributes are known.	<ul style="list-style-type: none"> • BPA (if requested) • Colstrip Owners • NorthWestern (lead) 	On-going: Will be addressed as replacement generation is identified.	
17	Studies should be completed using actual Montana wind data to confirm the diversity characteristics and balancing reserve requirements of new Montana wind resources.	BPA	To be completed Fall 2019.	Bart McManus/ Libby Kirby
18	NorthWestern's studies should be finalized that identify: <ul style="list-style-type: none"> a) Regulation and load following needs for existing wind resources; and, b) Regulation and load following needs for additional wind and solar resources. 	NorthWestern	Completed: NorthWestern filed this with its General Rate Review in September 2018.	
19	The viability of utilizing Colstrip units in condensing mode as well as the Gordon Butte pumped storage facility to provide voltage support, inertia and frequency response to be studied as appropriate.	<ul style="list-style-type: none"> • Absaroka Energy (pumped storage) • NorthWestern (lead) 	NorthWestern has reached out to INL, PSE and Talen on the Synchronous Condenser at Colstrip.	NorthWestern/ Absaroka Energy

RECLAMATION

Managing Water in the West

U.S. Department of the Interior
Bureau of Reclamation

John W. Keys III Pump-Generating Plant

The John W. Keys III Pump-Generating Plant pumps water uphill 280 feet from Franklin D. Roosevelt Lake to Banks Lake. This water is used to irrigate approximately 670,000 acres of farmland in the Columbia Basin Project. More than 60 crops are grown in the basin and distributed across the nation.

Congress authorized Grand Coulee Dam in 1935, with its primary purpose to provide water for irrigation. When the United States entered World War II in 1941, the focus of the dam shifted from irrigation to power production. It was not until 1943 that Congress authorized the Columbia Basin Project to deliver water to the farmers of central Washington State.

Construction of the irrigation facilities began in 1948. Components of the project include the pump-generating plant, feeder canal, and equalizing reservoir, which was later named Banks Lake.

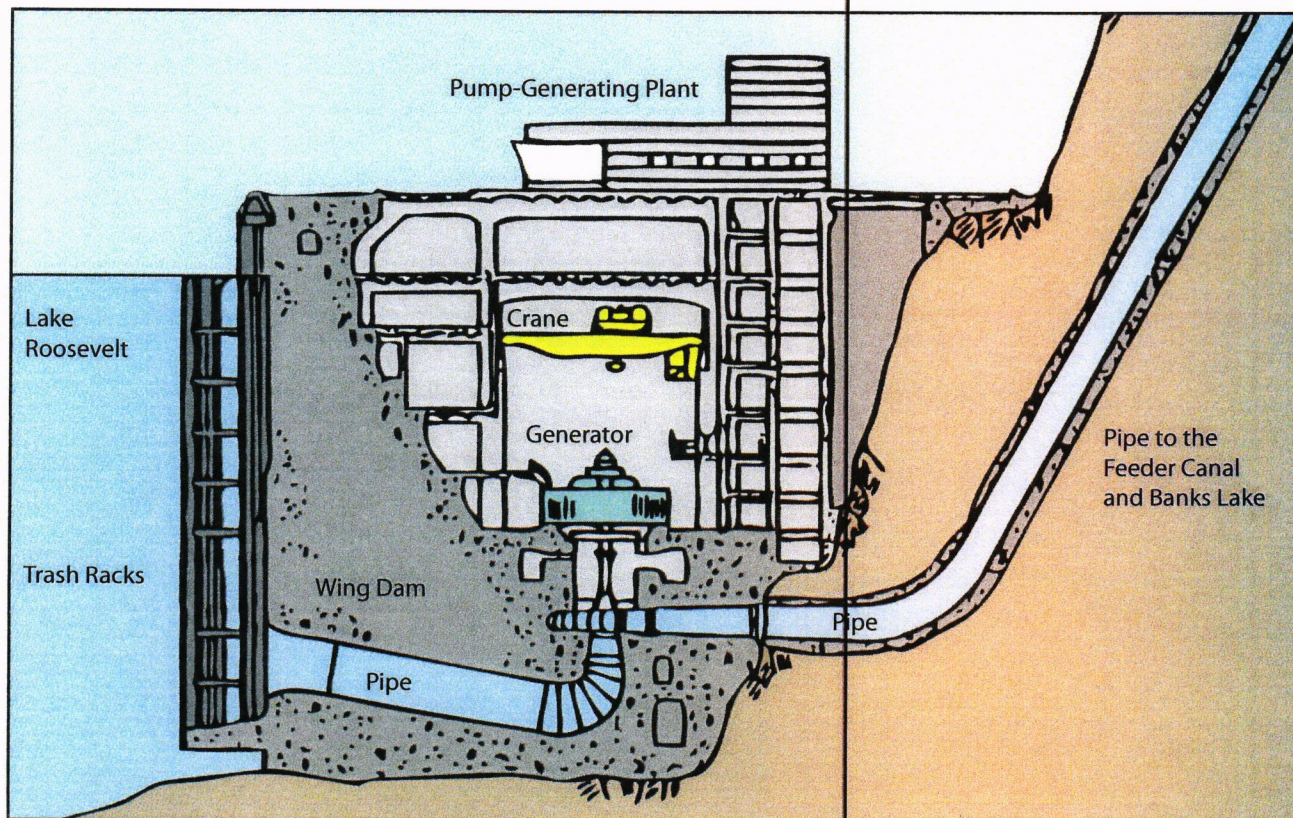
Banks Lake was formed by damming the northern 27 miles of the Grand Coulee, and has an active storage capacity of 715,000 acre-feet. The lake stores water

for irrigation and also provides important recreational benefits to the region.

The pump-generating plant began operation in 1951. From 1951 to 1953, six pumping units, each rated at 65,000 horsepower and with a capacity to pump 1,600 cubic feet per second, were installed in the plant.

In the early 1960s, investigations revealed the potential for power generation. Reversible pumps were installed to allow water from Banks Lake to flow back through the units to generate power during periods of peak demand. The first three generating pumps came online in 1973. Two more generating pumps were installed in 1983; the final generating pump was installed in January 1984. The total generating capacity of the plant is now 314,000 kilowatts.

In 2008, the pump-generating plant was renamed in honor of John W. Keys III. Keys was Commissioner of the Bureau of Reclamation from 2001 to 2006 and Pacific Northwest Regional Director from 1986 to 1998. He was killed in a plane crash in 2008.



Making Electricity at Grand Coulee Dam

How a Turbine Works

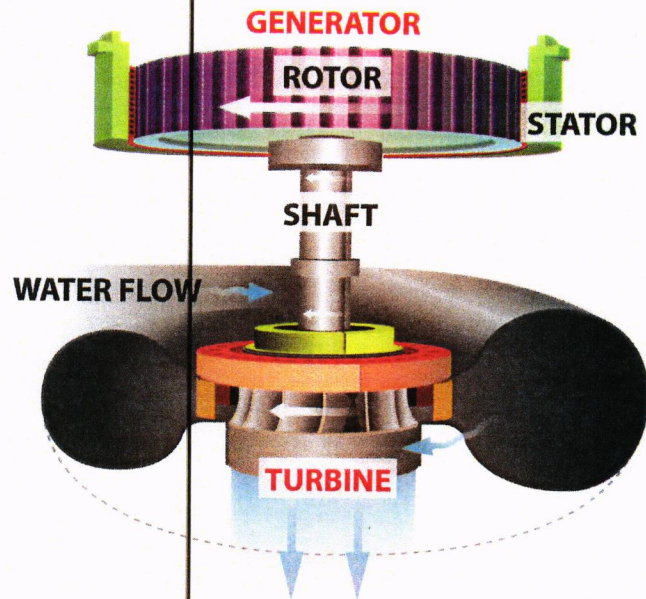
Electricity is made by spinning an electromagnetic field (rotor) through a stationary field of copper (stator). Falling water is the driving force; gravity ensures that water will always flow downhill.

The water flows through a large pipe called a penstock. The water pushes against the blades of the water wheel (turbine) causing it to spin.

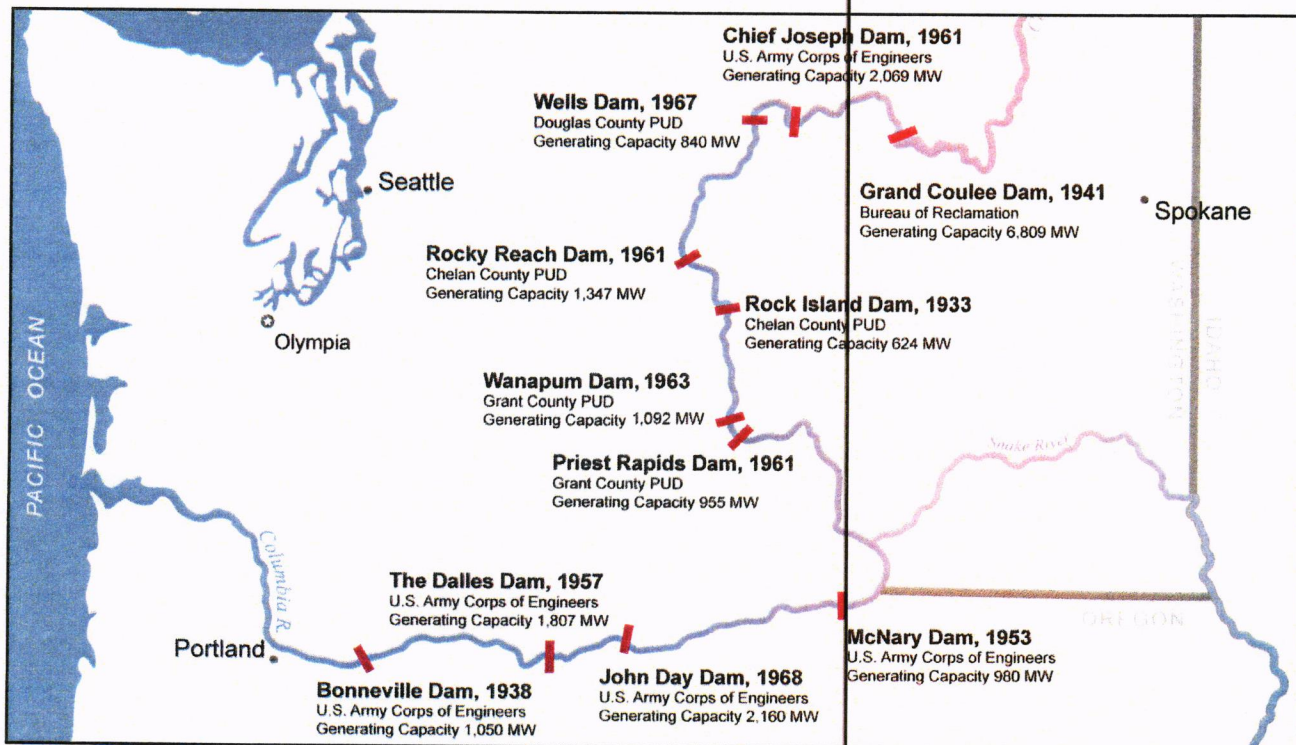
The turbine is connected to the generator by a shaft. As the rotor in the generator spins, the magnetic field sweeps through the copper, inducing an electron flow, which becomes electricity.

The electricity passes through a system of controlling switches, voltage changing transformers, and miles of wire before it is delivered to homes, industries, and businesses.

Visit <http://www.usbr.gov/pn/grandcoulee/index.html> for more information.



Major Hydropower Dams on the Columbia River in the U.S.



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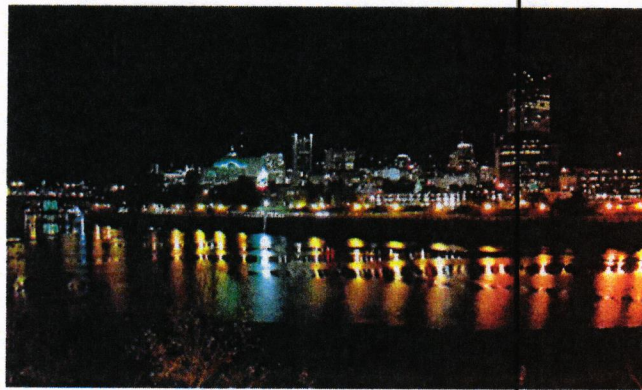
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BPA responds to deeply flawed article on agency's financial health

September 06, 2019

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Administrator Elliot Mainzer has issued a response to an inaccurate article by Greenwire, a division of E&E News, to correct the record on BPA's financial health.

In his response, Mainzer says BPA has made great strides in recent years to address competitive pressures in the power market and sustain financial health.

"I was deeply disappointed to read the mischaracterizations in Greenwire's Sept. 3 article on the issues facing BPA and the Pacific Northwest. The article painted a grossly inaccurate picture of BPA's current financial condition and failed to acknowledge the steps that Bonneville and its key partners are taking to ensure BPA remains the power provider of choice for its public power customers."

Contrary to the article, BPA is in very sound financial condition with investment-grade credit ratings from the three major ratings agencies. BPA continues to take steps to further improve its position through the fulfillment of a strategic plan the agency developed to address the very challenges discussed in the article.

Greenwire has updated the original article with a link to Mainzer's full response, which you can read below.

Related Articles (by tag)

[BPA shares third quarter financial outlook; proposes reserves error resolution](#)

Wednesday, July 31, 2019

[BPA: No increase to base power rates](#)

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[Mainzer reports to Congress on BPA's competitiveness, strategy](#)

Friday, March 15, 2019

[BPA adopts settlement agreement with customers on its open access transmission tariff](#)

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[BPA cuts costs in proposed rates for 2020 and 2021](#)

Thursday, December 06, 2018

Department of Energy

Bonneville Power Administration

P.O. Box 3621

Portland, Oregon 97208-3621



September 5, 2019

Cyril T. Zaneski
Executive Director
E&E News

Dear Cyril,

The Bonneville Power Administration has made great strides in recent years to address competitive pressures in the power market and sustain financial health, maintaining the agency's role in the Northwest as an engine of economic prosperity and environmental sustainability.

As BPA's administrator and CEO, I was deeply disappointed to read the mischaracterizations in Greenwire's Sept. 3 article on the issues facing BPA and the Pacific Northwest. The article painted a grossly inaccurate picture of BPA's current financial condition and failed to acknowledge the steps that Bonneville and its key partners are taking to ensure BPA remains the power provider of choice for its public power customers.

BPA takes its role in the region very seriously. The inaccuracies in this article mislead readers on the true nature of our finances, and do not help policymakers and stakeholders understand what is happening in the electricity market.

Although I also have concerns with the article's characterization of BPA's fish and wildlife program, I will not debate that issue here. I do want to correct the misrepresentation of BPA's finances.

Far from being on the verge of "going broke," BPA is in very sound financial condition, with investment-grade credit ratings from the three major ratings agencies. And we are taking steps every day to further improve our position through the fulfillment of a strategic plan we developed to address the very challenges discussed in the article. The article implies BPA does not have a plan to sustain its competitive position, which is absolutely false.

In addition, as the Northwest's biggest clean-power supplier, we see potential in the changing energy industry, particularly as states move toward decarbonization.

As the article correctly notes, however, power providers in the Northwest are having to adapt to the changing electricity market. In the Northwest, we have been blessed for decades with low-cost, abundant hydropower. But recently, the proliferation of cheap natural gas, large-scale development of variable energy resources such as wind and solar, and periods of oversupply have dampened wholesale energy prices and reduced BPA's wholesale market revenues.

Contrary to the article, which asserts California no longer needs BPA's power, BPA is actually projecting stronger surplus revenues from California sales in fiscal years 2020 and 2021 than what we saw in 2018 and 2019. Longer term, we see California as an important market for Northwest federal hydropower. It's true that wind and solar generation are increasing, but that means the need for flexible, reliable, low-carbon resources will increase as well. Hydropower is a highly sought-after resource to balance the variability and intermittency of wind

and solar. And through our ambitious and aggressive grid modernization initiative, we are taking steps to leverage and enable industry change that will allow us to capture the full value of our flexible hydropower resources in this low-carbon environment.

Another challenge the article highlights is the rising costs of maintaining the federal power and transmission system, as well as the costs of meeting our fish and wildlife responsibilities and other statutory obligations. This combination of lower revenues and higher costs placed significant upward pressure on BPA's rates over the past 10 years. Understandably, our public power customers, who buy power under long-term contracts that extend through 2028, expressed concerns about BPA's competitive position.

BPA shared that concern and took it as a call to action – a fact not noted by Greenwire. Our 2018-2023 Strategic Plan is focused on taking steps now to bend the cost curve and strengthen our commercial position so that we will be well-positioned for new contract negotiations with our customers in the next decade. Going forward, BPA is committed to managing costs at or below the rate of inflation to further strengthen the agency's competitive position. We have demonstrated this by reducing program costs by \$66 million per year during the next rate period, placing BPA on a much more sustainable rate trajectory.

We are also taking steps to manage BPA's debt over the next decade. Greenwire accurately reports BPA's debt as \$15 billion. But it's important to understand the context of this debt. First, BPA repays its debt with revenues from power and transmission sales – not with taxpayer dollars. BPA is a self-financed federal power marketing administration that does not rely on annual appropriations from Congress and must recover its costs through its rates. BPA's revenues far exceed the total debt coming due. In fiscal years 2020 and 2021, BPA is projecting annual revenues of \$3.8 billion, which will provide more than enough cash flow to cover the \$700 million in debt that will be due each of those years. When we made our annual U.S. Treasury payment last fiscal year, it marked the 35th year in a row BPA has made this payment on time and in full. Over that period, we have paid more than \$29.8 billion to Treasury, including \$5.5 billion earlier than scheduled. We are on track to make our full Treasury payment this fiscal year as well.

Consistent with our strategic and financial plans, we are taking steps to manage BPA's debt. The agency's debt-to-asset ratio has and will continue to decline. We also use tools to maintain healthy financial reserves. After making our next Treasury payment, BPA expects to close fiscal year 2019 with nearly \$800 million in financial reserves. We are also working to preserve our access to capital so we can continue to invest in the region's power and transmission infrastructure.

Like others in our industry, we face ongoing economic and environmental challenges. It is absolutely essential that BPA sustain the progress we have made in managing costs, strengthening finances, modernizing assets, providing competitive products and services and meeting the changing needs of the region's power system. We appreciate the enduring interest and concern of our key partners in BPA's long-term economic viability. We will need their continued support to sustain Bonneville's vital role in the Northwest.

Sincerely,

Elliot E. Mainzer
Administrator and CEO

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